

BLE Asset Tagging System

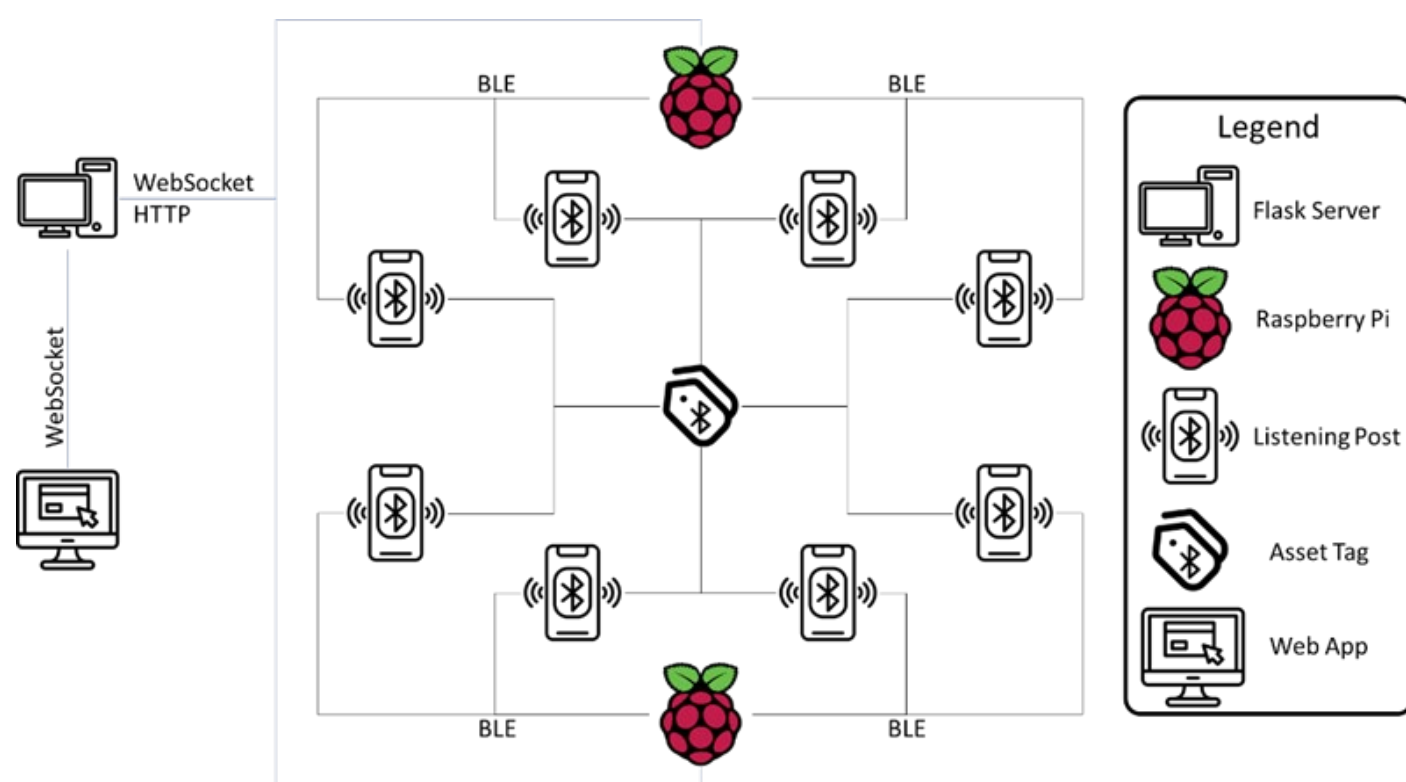
Track your assets in real-time with precision and ease

Student: Chee Jia Yuan

Supervisor: Mr Oh Hong Lye

Project Objectives

The goal of this project is to create and implement a real-time indoor positioning system that will help users find their assets indoors and track any movement of their assets. This system will use nRF52840 tags as listening posts and asset tags and any Bluetooth-enabled devices to approximate the location of the asset tag. The focus is to develop a production-ready infrastructure and data collection pipeline which can facilitate easier and maintainable data collection.



Hardware Components

12 Adafruit Feather nRF52840 Express were used, with 8 of them serving as listening posts placed around the area to be tracked, and 4 of them acting as asset tags to be placed in the tracking area. Raspberry Pis will be placed near listening posts to receive signal data which will be uploaded to a cloud server. The listening posts will scan and report the signal strengths (RSSI) of the various asset tags in the area and this collection of different signal strengths observed from different listening posts will be used for coordinate prediction.



Software Components

A commissioning tool was developed to ease the deployment process. This application allows laymen to quickly set up multithreaded connections to listening posts to start collecting data. A cloud hosted Flask server, preloaded with frozen TensorFlow models was used to collect signal strength (RSSI) data and predict the location of the Asset Tag in real-time. Finally, the predicted coordinates are sent to a real-time web dashboard with a 3D grid for quicker visualisation of the various asset tags as well as extensibility for future height prediction.

